

What is claimed is:

1 1. A method of task classification using morphemes which operates
2 on the task objective of a user, the morphemes being generated by clustering
3 selected ones of salient sub-morphemes from training speech which are
4 semantically and syntactically similar, comprising:

5 detecting morphemes present in the user's input communication;
6 and
7 making task-type classification decisions based on the detected
8 morphemes in the user's input communication.

1 2. The automated task classification method of claim 1, wherein the
2 morphemes include at least one of verbal speech and non-verbal speech.

1 3. The automated task classification method of claim 2, wherein the
2 non-verbal speech includes the use of at least one of gestures, body movements,
3 head movements, non-responses, text, keyboard entries, keypad entries, mouse
4 clicks, DTMF codes, pointers, stylus, cable set-top box entries, graphical user
5 interface entries and touchscreen entries.

1 4. The automated task classification method of claim 1, wherein the
2 morphemes are expressed in multimodal form.

1 5. The automated task classification method of claim 1, wherein the
2 user's input communication is derived from the verbal and non-verbal speech
3 and the user's environment.

1 6. The automated task classification method of claim 1, wherein the
2 morphemes in the user's input communication are derived from the user's
3 actions, including the user's focus of attention.

1 7. The automated task classification method of claim 1, further
2 comprising entering into a dialog with the user to obtain a feedback response
3 from the user.

1 8. The automated task classification method of claim 7, wherein the
2 user is prompted to provide a feedback response includes additional information
3 with respect to the user's initial input communication.

1 9. The automated task classification method of claim 7, wherein the
2 user is prompted to provide a feedback response that includes confirmation with
3 respect to at least one of the set of task objectives determined in the
4 classification decision.

1 10. The automated task classification method of claim 1, wherein the
2 input communication is routed based on the classification decision.

1 11. The automated task classification method of claim 10, wherein the
2 task objective is performed after the input communication is routed.

1 12. The automated task classification method of claim 1, wherein the
2 method operates in conjunction with one or more communication networks, the
3 communication networks including a telephone network, the Internet, an intranet,
4 Cable TV network, a local area network (LAN), and a wireless communication
5 network.

1 13. The automated task classification method of claim 1, wherein the
2 method is used for customer care purposes.

1 14. The automated task classification method of claim 1, wherein the
2 classification decisions and corresponding user input communications are
3 collected for automated learning purposes.

1 15. The automated task classification method of claim 1, wherein the
2 relationship between the generated morphemes and the predetermined set of
3 task objectives includes a measure of usefulness of a one of the morphemes to a
4 specified one of the predetermined task objectives.

1 16. The automated task classification method of claim 15, wherein the
2 usefulness measure is a salience measure.

1 17. The automated task classification method of claim 16, wherein the
2 salience measure is represented as a conditional probability of the task objective
3 being requested given an appearance of the morpheme in the input
4 communication, the conditional probability being a highest value in a distribution
5 of the conditional probabilities over the set of predetermined task objectives.

1 18. The automated task classification method of claim 16, wherein
2 each of the plurality of generated morphemes has a salience measure exceeding
3 a predetermined threshold.

1 19. The automated task classification method of claim 1, wherein the
2 relationship between the generated morphemes and the predetermined set of
3 task objectives includes a measure of commonality within a language of the
4 morphemes.

1 20. The automated task classification method of claim 19, wherein the
2 commonality measure is a mutual information measure.

1 21. The automated task classification method of claim 20, wherein
2 each of the plurality of generated morphemes has a mutual information measure
3 exceeding a predetermined threshold.

1 22. The automated task classification method of claim 11, wherein the
2 step of making a classification decision includes a confidence function.

1 23. The automated task classification method of claim 11, wherein the
2 input communication from the user represents a request for at least one of the
3 set of predetermined task objectives.

1 24. The automated task classification method of claim 11, wherein the
2 input communication is responsive to a query of a form "How may I help you?".

1 25. The automated task classification method of claim 11, wherein
2 each of the verbal and non-verbal speech are directed to one of the set of
3 predetermined task objectives and each of the verbal and non-verbal speech is
4 labeled with the one task objective to which it is directed.

1 26. A method of task classification which operates on the task objective
2 of a user, comprising:

3 selecting salient phone-phrases from training speech;
4 generating acoustic morphemes by clustering selected ones of the
5 salient phone-phrases which are semantically and syntactically similar;
6 detecting acoustic morphemes present in the user's input
7 communication; and

8 making task-type classification decisions based on the detected
9 acoustic morphemes in the user's input communication.

1 27. A method of task classification which operates on the task objective
2 of a user, comprising:

3 selecting salient sub-morphemes from training speech;
4 generating morphemes by clustering selected ones of the salient
5 sub-morphemes which are semantically and syntactically similar;

6 detecting morphemes present in the user's input communication;
7 and

8 making task-type classification decisions based on the detected
9 morphemes in the user's input communication.

1 28. A method of task classification using acoustic morphemes which
2 operates on the task objective of a user, the acoustic morphemes being
3 generated by clustering selected ones of salient phone-phrases from training
4 speech which are semantically and syntactically similar, comprising:

5 detecting acoustic morphemes present in the user's input
6 communication; and

7 making task-type classification decisions based on the detected
8 acoustic morphemes in the user's input communication.